Teens *at* Work

Work-Related Injuries to Teens in Massachusetts, 2000-2004

Injury Surveillance Update • December 2007

Teens at Work: Injury Surveillance and Prevention Project
Occupational Health Surveillance Program • Massachusetts Department of Public Health

DATA HIGHLIGHTS

- From 2000 through 2004, six teenagers under age 18 were fatally injured while working in Massachusetts. Three of these teens were doing tasks or jobs prohibited by the child labor laws at the time of injury.
- From 2002 through 2004, there were 3,012 emergency department visits for work-related injuries to teens.
- From 2000 through 2004, there were 1,410 workers' compensation lost wage claims filed by teens in Massachusetts.
- The majority of injuries were to 16- and 17-year-olds, and males had higher rates of injuries than females based on both emergency department visits and workers' compensation claims.
- The largest numbers of non-fatal injuries to young workers from 2000 through 2004 occurred in restaurants (30%), followed by grocery stores (13%). The highest rate of injury was in nursing homes.
- Of 798 injured teens who were interviewed since 1993, 51% reported they had received no on-the-job training about how to work safely and avoid injury, 34% reported they had no work permits for their jobs at the time they were injured, and 17% reported one or more anticipated permanent effects from their injuries.

Preventing Injuries to Working Teens

Work is part of everyday life for many teenagers. An estimated 80% of teens in the U.S. are employed at some point during high school[1]. According to government workforce statistics, Massachusetts teens are more likely to work than youth in the country as a whole. From 2000 through 2004, 36% (63,315) of Massachusetts' 16- and 17-year-olds were employed on average at any given point compared to 30% of 16- and 17-year-olds nationwide[2]. These statistics do not include the many 14- and 15-year-olds who also hold jobs.

Employment can provide many benefits for youth. In addition to income, work offers teens the opportunity to learn job skills, to explore future careers, and in some cases to enhance their academic education. However, working teens also face health and safety risks. Each year in the U.S. over 66,000 teens seek care in emergency departments for work-related injuries, hundreds are hospitalized, and over 50 are killed[3]. In fact, teen workers have a higher rate of non-fatal injuries per hour worked than adults[1]. This is, in part, explained by the types of jobs they do; many of the jobs in which teens are commonly employed have higher than average risks for workers of all ages. Inexperience, lack of safety training, and inadequate supervision, as well as developmental factors—physical and psychological—may also increase risks for young workers[4].

Information about where and how young workers are injured on the job is essential to develop effective prevention strategies and to promote safe work opportunities for youth. The Massachusetts Department of Public Health's (MDPH) *Teens at Work: Injury Surveillance and Prevention Project* (TAW) collects data on work-related injuries to teens under age 18. TAW uses this information and works with other government agencies and community partners to prevent injuries to working teens in Massachusetts. This surveillance update provides an overview of work-related injuries to teens in Massachusetts from 2000 through 2004.

The Massachusetts *Teens at Work* Injury Surveillance System

Since 1993, MDPH has had federal funding to track work-related injuries to teens under age 18 in Massachusetts. TAW uses multiple data sources to track both fatal and non-fatal work-related injuries.

Information about fatalities is collected as part of the MDPH Fatality Assessment and Control and Evaluation (FACE) project, which relies on death certificates, newspaper clippings, Occupational Safety and Health Administration (OSHA) records, and other information sources to identify all work-related deaths.

TAW collaborates with the FACE project in conducting research-oriented investigations of teen worker deaths and develops and disseminates recommendations to prevent similar fatal incidents in the future.

For tracking non-fatal injuries, TAW likewise relies on several data sources. Since 1992, Massachusetts public health regulations have mandated that hospitals report cases of work-related injuries to teens under age 18 to MDPH. A sample of hospital emergency departments has actively reported work-related injuries to TAW on a monthly basis since that time. These reports are used to identify cases with which to conduct follow-up interviews and guide intervention activities as described below. In 2001, the Massachusetts Division of Health Care Finance and Policy began collecting data on emergency department (ED) visits from all acute care hospitals in the state. Since then, TAW has used this statewide ED database to identify all emergency department visits by teens for treatment of work-related injuries. This database includes information about patient demographics, nature and external cause of injury, and payer source. TAW considers an injury as work-related if workers' compensation is designated as the primary payer in the ED database.

Under the workers' compensation (WC) system, injured workers are eligible for payment of medical bills and/or replacement of lost wages if they lose five or more days of work as a result of their injuries. TAW also uses workers' compensation lost wage claims filed with the Massachusetts Department of Industrial Accidents to identify injuries to working teens. Unlike the statewide ED data, the WC records include information about the industries in which injured teens are employed, as well as patient demographics and injury type.

TAW conducts follow-up telephone interviews with a sample of injured teens to learn more about their injuries and work experiences. Teens are asked about the tasks and tools associated with their injuries, workplace health and safety training, supervision at the time of injury, whether or not they have work permits, and the impact of the injuries on their lives.

For a detailed description of the surveillance system see the publication, *Protecting Young Workers: A Guide for Building a State Surveillance System for Work-Related Injuries to Youths*, available at: www.mass.gov/dph/teensatwork.

Organization of this Report and Methods

This surveillance update provides an overview of work-related injuries to youth under age 18 that occurred in Massachusetts from January 2000 through December 2004.

It begins with information on fatal occupational injuries collected by the FACE (Fatality Assessment and Control Evaluation) project. The second section provides an overview of non-fatal injuries to teens using the available statewide emergency department data (2002-2004) and data on workers' compensation claims for injuries resulting in five or more lost work days. In the final section, findings based on interviews with injured teens are highlighted.

For this report, injuries in the ED database are defined as ED visits with a primary ICD-9 diagnostic code between 800-999. Follow-up visits are not included unless the original injury was not already in the database. Injuries in the workers' compensation claims database are defined as claims with Occupational Injuries and Illnesses Classification System Nature of Injury codes between 0000-0990. The rates presented in this report are defined as the average annual number of injuries (ED visits or WC claims filed) per 100 full-time workers. Information on the number of teens employed was obtained from the 2000 Census. Rates are computed only for workers 16- and 17-years-old because employment statistics exclude those younger than age 16. The ED and WC cases are not mutually exclusive. Some of the cases treated in EDs may have also filed workers' compensation claims for lost wages.

Limitations of the Surveillance Data

Not all workers who are injured on the job file workers' compensation claims, and there is some evidence that younger workers are less likely than older workers to do so[5,6]. In addition, emergency department records do not capture hospitalizations or injuries treated in doctors' offices or other outpatient settings. Consequently, the findings for non-fatal injuries to working teens presented in this report likely underestimate the true magnitude of the problem.

The available data on youth employment by industry in Massachusetts during the five years covered by this report are limited. The injury rates for 16- and 17-year-olds

I was using the deli slicer to cut up lettuce and place it in the freezer. Having finished the task, I hit the off button and went to grab the lettuce, not realizing the blade had not completely stopped yet. When I went to grab the lettuce, the tip of my finger was hit by the slicer.

~17-year-old deli worker

The Child Labor Laws in Massachusetts prohibit anyone who is under age 18 to operate, clean or repair power-driven meat slicers.

included in this report are based on employment data from the 2000 Census and assume that employment numbers for 16- and 17-year-olds remained stable during the five year surveillance period. This was not necessarily the case. Occupational illnesses, many of which develop years after exposure, are not routinely captured in the surveillance system and are not included in this report.

Fatal Occupational Injuries

Six teens under age 18 were fatally injured at work in Massachusetts from 2000 through 2004:

- 16-year-old boy, driving a golf cart on a golf course when he collided into a deck, crushing his chest.
- 16-year-old boy, driving a forklift in a warehouse when the forklift overturned (see box at right).
- 17-year-old boy, working for an electrician who died of complications after tearing a muscle while doing heavy lifting.
- 15-year-old boy, killed when he was struck by several heavy granite slabs, which were stored in an A-frame, that fell on him while he was clearing snow at a stone carving shop.
- 16-year-old boy, killed while driving a forklift without a load on uneven ground when it tipped over and crushed him.
- 17-year-old boy, working on a scalloping vessel that sank.

Three of these deaths involved teens driving vehicles for work—an activity prohibited under the child labor laws at the time of the incidents.

The Occupational Safety and Health Administration (OSHA) investigated three of these fatal incidents and found violations of OSHA standards in all three cases.

Non-fatal Occupational Injuries

Magnitude of the Problem

- From 2002 through 2004, there were 3,012 ED visits for work-related injuries among teens ages 14-17, an average of 1,004 visits per year.
- The average annual rate of ED visits for work-related injuries to 16- and 17-year-olds was 3.1 per 100 full time workers.
- An average of 282 WC lost wage claims for injuries resulting in five or more lost workdays were filed by teens ages 14-17 each year from 2000 through 2004.
- The average annual rate of lost wage claims filed by 16- and 17-year-olds was 0.9 per 100 full time workers.

A 16-year-old Massachusetts Youth Fatality: Injured while Operating a Forklift

In July 2003, a 16-year-old male stock clerk was fatally injured when the forklift he was operating overturned. The victim, who was not wearing a seatbelt, was operating the forklift with the tines raised on an outdoor ramp. When the forklift started to tip, the victim either attempted to jump away from the forklift or was thrown from the operator's seat. The forklift landed on the victim's chest and abdomen, crushing him. Both Federal and State child labor laws prohibit youth under age 18 from operating forklifts at work.

To prevent similar incidents, the Massachusetts FACE and TAW projects recommended that employers of young workers:

- establish work policies and procedures that comply with Federal and State child labor laws;
- provide adequate supervision for young workers;
- ensure that forklift keys are kept in a locked location and are only accessible by trained and authorized employees; and
- develop, implement and enforce a comprehensive safety program that includes training in safe operation of forklifts.

All of these points were absent in this incident.

Several years prior to this death, a similar incident occurred in Massachusetts involving a 16-year-old boy who was also killed when a forklift he was operating at work overturned. This incident led the MDPH FACE and TAW projects to develop a young worker forklift safety sticker, thousands of which have been disseminated to forklift manufacturers and rental agencies in Massachusetts and around the country.

Sticker available on the Department of Labor website: http://youthrules.dol.gov/posters.htm#Sticker

Gender and Age

- Close to 90% of work-related injuries among youth under age 18 identified in both data sources (ED and WC) were sustained by 16- and 17-year-olds. Injuries to 17-year-olds accounted for approximately 60% of all cases (Figure 1).

- Less than 10% of the injuries were sustained by teens under age 15. Younger teens are less likely to work and also are prohibited by child labor laws from working in some of the more hazardous jobs, such as construction and manufacturing jobs, in which older teens are allowed to work. It was not possible to compute injury rates for younger teens because employment statistics for those under age 16 were not available.

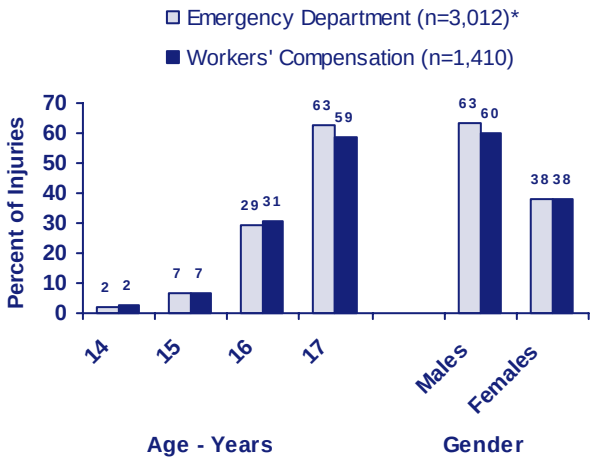
- The majority of the injuries (between 57% and 68%) identified in both data sources were sustained by males, in all age groups. This was not simply explained by males working more hours. Males had higher injury rates per hours worked (Figure 2):

  - The average annual rate of ED visits for work-related injuries for 16- and 17-year-old males from 2002 through 2004 was 3.7 per 100 full-time workers, compared to a rate of 2.4 per 100 full-time workers for females.

  - The average annual rate of WC claims for lost time injuries filed by males was 1.0 per 100 full-time workers, compared to a rate of 0.7 per 100 full-time workers for females.

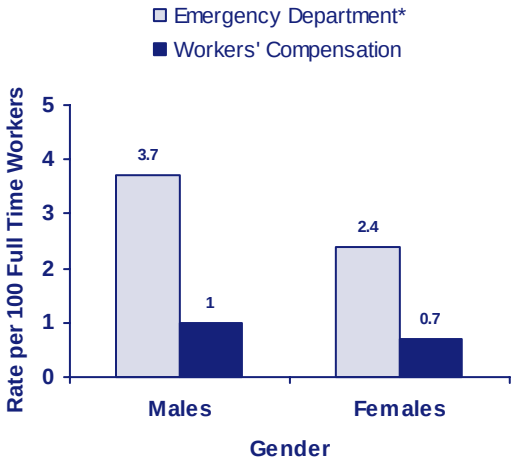
- High occupational injury rates among males is consistent with findings in previous studies and is due largely to the fact that males are more likely to be employed in higher risk jobs[7]. There is also anecdotal evidence from surveys of working teens that males may be assigned to more dangerous tasks within the same jobs.

Figure 1. Distribution of Work-Related Injuries to Teens under Age 18, by Age, Gender, and Data Source, Massachusetts, 2000-2004



* The emergency department data are available for 2002-2004 only.
Note: Seventeen cases were younger than 14-years-old, and gender was missing for 25 cases in the emergency department data. These cases were not included in the calculations.
Source: Teens at Work Injury Surveillance System

Figure 2. Average Annual Rates of Work-Related Injuries among 16- and 17-Year-Olds, by Gender and Data Source, Massachusetts, 2000-2004



* The emergency department data are available for 2002-2004 only.
Source: Teens at Work Injury Surveillance System

I was working by myself. The store was very busy and I was working the counter and drive-through. I hurried to brew coffee and pulled out the basket, not realizing coffee was still brewing. Hot water and grounds spilled onto my hand. I rinsed it in cold water and put it in ice. I called my boss, who told me it wasn't a major injury and to keep working. He did not come to the store and did not want me to go to the "expensive ER." The next day, I woke up and my hand was swollen and red and purple. I went to the ER and they told me I had a second degree burn.

~16-year-old coffee shop employee

Nature of Injury

The distribution of the types of work-related injuries to young workers differed by data source (Figure 3):

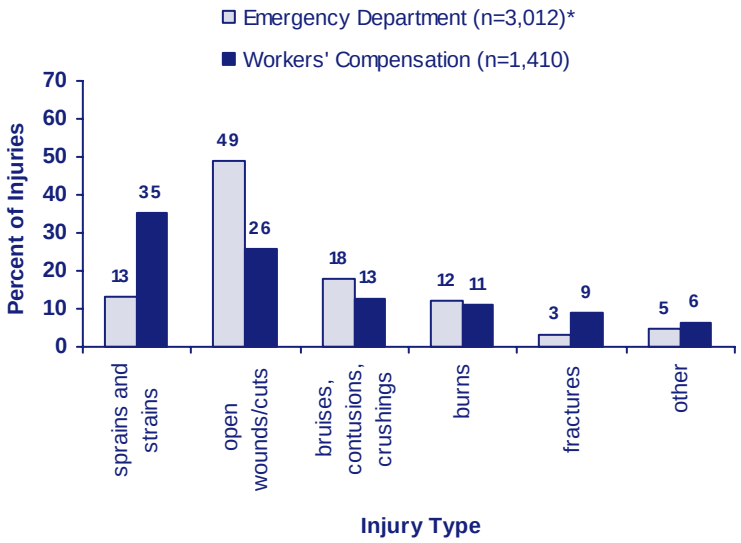
- Open wounds were the most frequent work-related injuries treated in EDs, accounting for 49% of the injury visits by working teens. Bruises, contusions and crushings were the second leading injury (18%) followed by sprains and strains, and burns, each of which accounted for approximately 13% of the visits.
- In contrast, sprains and strains were the leading injury (35%) for which lost wage claims were filed by teens. Approximately 37% of all sprains and strains involved the back. Cuts and lacerations (open wounds) were the second most frequent type of injury, accounting for 26% of the lost time claims filed.
- Fractures accounted for 3% of the ED cases and 9% of the WC cases.
- There were 16 ED visits by teens for work-related amputations during the 3 year period. An additional 9 WC claims were filed for amputations during the 5 year period. All but 2 amputations involved the fingers, hand or toes.

Race and Ethnicity

Information about race and ethnicity was available in the ED data set, but not in the WC claims data set.

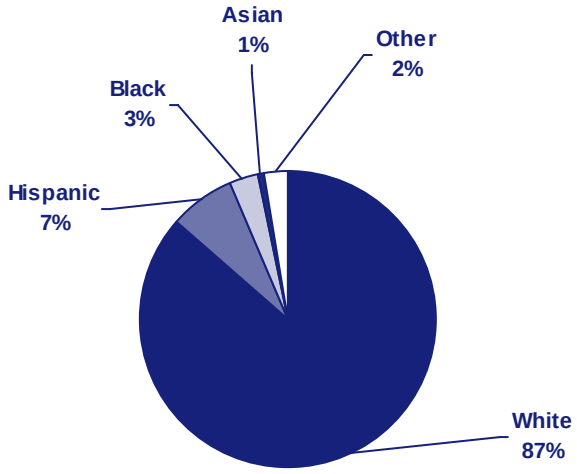
- The racial and ethnic distribution of the teens visiting EDs for work-related injuries was similar to that of the teen workforce. Whites made up the majority of cases (87%), followed by Hispanics (7 %) (Figure 4).

Figure 3. Distribution of Work-Related Injuries to Teens under Age 18, by Injury Type and Data Source, Massachusetts, 2000-2004



* The emergency department data are available for 2002-2004 only.
Note: Nature of injury was missing for 67 cases in the emergency department data, and 175 cases in the workers' compensation data. These cases were not included in the calculations.
Source: Teens at Work Injury Surveillance System

Figure 4. Distribution of Work-Related ED Visits With Expected Payer Workers' Compensation, by Teens under Age 18, by Race, Massachusetts, 2002-2004 (n=2,942)



Source: Teens at Work Injury Surveillance System

My boss was cutting down trees on the farm and my co-worker and I were splitting the wood with the log-splitter. Although the log-splitter is only supposed to be operated by one person, the two of us were involved in the process since it took two people to set the wood in place (the logs were three feet in diameter). I had just positioned this one log to be split when I saw that it was going to fall over. I went to grab the log, not realizing that my co-worker had just hit the button to split the wood. The metal punch of the machine then hit a finger on my left hand with 2,500 pounds of force, crushing my finger.

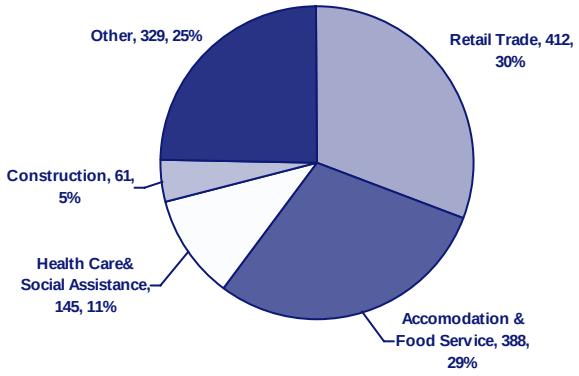
~16-year-old farm worker

Industry

Information about the industry in which the injured teens were employed was available in the WC claims but not the ED data set (Figure 5).

- Almost half (47%) of all the injuries in the retail trade occurred in grocery stores.
- The vast majority (96%) of injuries in the accommodation and food service sector occurred in restaurants.
- Within restaurants, 66% of injuries happened in limited service establishments, which include fast food places, pizzerias, donut/bagel shops, and coffee shops.
- Nursing homes accounted for the largest number of injuries in the health care and social assistance sector.
- Some examples of the industries in the "other" category are public administration, manufacturing, and educational services.
- Restaurants had the highest average number of injuries, while nursing homes had the highest annual rate of injuries per 100 full-time workers (Table 1).

Figure 5: Distribution of Workers' Compensation Claims Filed with 5+ Days Away from Work by Teens under Age 18, by Industry Sector (NAICS 97), Massachusetts, 2000-2004 (n=1,410)



Note: Of the 1,410 injuries identified in this time period, there were 75 cases for which industry was missing. These cases were not included in the calculations.
Source: Teens at Work Injury Surveillance System

Further information about injuries and source of injuries by industry is available on the MDPH TAW website: www.mass.gov/dph/teensatwork.

Table 1. Average Annual Number and Rate of Workers' Compensation Lost Time Claims for Non-Fatal Work-Related Injuries Among 16- and 17-Year-Olds by Industry, Massachusetts, 2000-2004*

Industry	Average # of Injuries Per Year	Annual Rate Per 100 Full-Time Workers (95% CI)	Leading Injury
Restaurants	65.8	1.04 (0.80-1.51)	Cuts (28%)
Grocery Stores	37.8	1.14 (0.87-1.66)	Sprains (39%)
Nursing Homes	15.8	3.00 (2.22-4.64)	Sprains (54%)
Construction	10.6	1.02 (0.76-1.57)	Cuts (30%)
Public Administration	5.8	2.79 (1.89-5.27)	Fractures (24%)
Transportation & Warehousing	5.0	1.79 (1.25-3.12)	Sprains (32%)
All Industries	239.2	0.80 (0.62-1.15)	Sprains (33%)

*Rates were computed for industries with an average of 5 or more cases per year. Table is limited to industries with higher than average rates.
Source: Teens at Work Injury Surveillance System

I went to plug-in the fry hopper (machine we cook fries in). I reached behind the machine to where the outlet was and got zapped. I fell backwards onto my bottom and my right arm was numb. While I was lying on the floor my manager came over to help me. My arm was still numb so he called an ambulance. Since then, the outlet has been fixed, and you no longer have to reach behind the fry hopper to plug it in.

~17-year-old fast food restaurant employee

WHAT INJURED TEENS HAVE TO SAY

Teens at Work Project staff have completed phone interviews with 798 young workers injured on-the-job since 1993. While the information from these interviews is not necessarily representative of all young workers who have been injured, it nevertheless provides some important insights.

Of these interviewed teens:

- Fifty-one percent reported they had received no on-the-job training about how to work safely and avoid injury. This finding is consistent with other studies.
- Thirty-four percent reported they had no work permits for their jobs at the time they were injured, which is slightly higher than other studies. **NOTE:** Massachusetts child labor laws require teens to have work permits which may be obtained through the school district where the teen resides or attends school.
- As a result of their injuries, teens reported they couldn't perform their usual activities for an average of 29 days.
- Seventeen percent of injured teens reported one or more anticipated permanent effects from their injuries.
- Seventy-five percent believed their injuries were preventable.
- Fifteen percent reported that no supervisor or person responsible for supervising them was on the premises at the time of injury.
- It appeared that 9% of injured teens were performing a task or working hours prohibited under the child labor laws.

Conclusions

Working teens are vital members of the Massachusetts labor force. Child labor laws reflect the long standing social policy that youth deserve extra protection in the workplace. We have come a long way from the exploitative child labor in the early days of the industrial revolution when our state child labor laws were first passed. However, surveillance findings presented here indicate that our work in the Commonwealth is not done. Working adolescents today deserve our attention. Too often, young worker health and safety is only thought about after the fact—when a working teen is killed or when future career and life options are curtailed as a result of injuries. The surveillance data presented here are intended to help in developing proactive approaches to protecting teens at work.

The science of injury control places primary emphasis on reducing hazards. TAW surveillance findings point to the need for innovative approaches to reduce hazards in common teen jobs, such as those in restaurants, grocery stores, and nursing homes. Hazard reduction efforts—such as redesigning equipment, changing the layout of work stations, and redefining job tasks in these industries—will benefit workers of all ages (see box at right).

Health and safety training is also an essential component of workplace safety programs. TAW findings from interviews with injured teens underscore the need for more health and safety training. MDPH has collaborated in developing teen-oriented health and safety curricula for use by schools, youth serving organizations, and youth employment programs (see resources on page 8).

Vocational schools in Massachusetts are also working with the Occupational Safety and Health Administration and the Division of Occupational Safety to provide more extensive health and safety training to students. While school based training is important to provide general health and safety skills, job specific training, as well as adequate supervision provided by employers, remain essential. Health and safety training should be part of the job.

Surveillance findings also highlight the need for increased compliance with child labor laws. In January 2007, the Massachusetts legislature took an important step forward by updating the state child labor law. The updated law streamlines the work permit process and allows the Attorney General to issue civil citations or pursue criminal sanctions, providing a more workable mechanism for enforcing the law. Also, any youth working after 8 pm must now be directly supervised by an adult. (See the list of resources on the next page to obtain more information about the child labor laws and other resources available to parents, teens, and employers.)

The combined efforts of government, employers, schools, and parents—as well as teens themselves—are needed to assure safe and meaningful work experiences for youths. MDPH remains committed to tracking injuries to working teens to help guide these efforts.

Using Data to Prevent Burn Injuries in Food Services

When TAW found large numbers of burn injuries to young workers employed in coffee shops, interviews with injured teens identified hot coffee as the culprit. TAW presented these data to the industry. Within a year, new safety equipment for coffee makers was introduced.

Resources

Child Labor Laws & Wages:

Massachusetts Attorney General's Office
Fair Labor Division
(617) 727-3465
www.mass.gov/ago

US Department of Labor
Wage and Hour Division
(617) 624-6700
www.dol.gov/esa/whd

Work Permits:

Massachusetts Department of Labor
Division of Occupational Safety
(617) 626-6952
www.mass.gov/dos/youth

Workers' Compensation:

Massachusetts Department of Labor
Department of Industrial Accidents
(800) 323-3249 ext. 470
www.mass.gov/dia

Health & Safety:

US Department of Labor
Occupational Safety & Health Administration (OSHA)
Methuen—(617) 565-8110
Braintree—(617) 565-6924
Springfield—(413) 785-0123
www.osha.gov

Massachusetts Department of Labor
Division of Occupational Safety
Occupational Hygiene/Indoor Air Quality Program
(617) 969-7177
www.mass.gov/dos

Massachusetts Department of Public Health
Teens at Work: Injury Surveillance and Prevention Project
(617) 624-5632
www.mass.gov/dph/teensatwork

Discrimination at Work:

Massachusetts Commission Against Discrimination
(617) 727-3990
www.mass.gov/mcad

US Equal Employment Opportunity Commission
Boston Area Office
(800) 669-4000
www.eeoc.gov/boston

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